



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
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SEP 08 2000

SEP 13 2000

Stephan Mahfood, Director
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P.O. Box 176
Jefferson City, Missouri 65102

Dear Mr. Mahfood:

We have completed our review of the revisions to the Missouri Water Quality Standards under Missouri's Code of State Regulations (CSR), Division 20, Chapter 7, which your Agency submitted for review and approval to the United States Environmental Protection Agency (EPA) in two separate submissions on April 14, 1994, and December 9, 1996, as required under federal regulations at 40 C.F.R. § 131.20.

Under Section 303(c) of the Clean Water Act (CWA), 33 U.S.C. § 1313(c), states are to submit revised or new water quality standards to EPA for review and approval no less frequently than every three years. Federal regulations at 40 C.F.R. §§ 131.20, 131.21 and 131.22 implement these requirements. Missouri's previous review and revision of its water quality standards regulations at 10 CSR 20-7.031 was completed and adopted by the Missouri Clean Water Commission (MCWC) on December 12, 1990. EPA approved the revisions on June 11, 1991.

The April 14, 1994, and December 9, 1996, submissions addressed by this letter consist of three separate revisions of water quality standards conducted by the Missouri Department of Natural Resources (MDNR) and adopted by the MCWC. The April 14, 1994, submission included a single revision to Chapter 7 adopted by the MCWC on December 16, 1993, and the December 9, 1996, submission included two separate revisions to Chapter 7 adopted by the MCWC on March 13, 1996, and June 25, 1996. As part of the review process, the MCWC held three public hearings to receive public input and comment on the proposed water quality standards revisions adopted on December 16, 1993, March 13, 1996, and June 25, 1996. EPA considers the State's December 9, 1996, submission of the two most recent revisions to the water quality standards to constitute the last triennial review. Based on our review, the State's public participation process is consistent with and satisfies the procedural requirements of 40 C.F.R. § 131.20. The State is presently preparing a comprehensive review of its water quality standards regulations at 10 CSR 20-7.031 which will serve as its next triennial review.

The State's adoption of a significantly larger number of numeric water quality criteria under this revision provides a greater level of protection for State waters and is consistent with the goals of the CWA. The addition of a number of stream segments and lakes to the classification of surface waters represents an expanded coverage of the waters of the State by the CWA and State water quality standards. EPA encourages the State to continue to expand the number of water bodies protected under the CWA, including the designation of all waters for the protection of aquatic life and whole body contact consistent with Section 101(a)(2) of the Act, 33 U.S.C. 1251 et seq.

SECTION I: ITEMS EPA IS NEITHER APPROVING NOR DISAPPROVING

Several provisions either adopted or revised by the State as part of its revisions of the water quality standards address the regulation of discharges to specific water bodies or types of water bodies. EPA considers these revisions to constitute permitting regulations rather than water quality standards regulations subject to EPA review and approval under authority at 40 C.F.R. §131.5. EPA is, therefore, taking no action under Section 303(c) of the CWA or federal regulations at 40 C.F.R. §131.5 with regard to the State adoption of these provisions. In its review of these specific revisions, EPA determined that all but one (i.e. 10 CSR 20-7.031(4)(P)) of the following provisions would not cause the State to take action which would potentially impair designated uses, violate federal water quality standards regulations or generally be inconsistent with the CWA.

A. Metropolitan No-Discharge Streams

Revisions to 10 CSR 20-7.031(6) would expand the application of the State's prohibition against the discharge of water contaminants to streams identified in Table F of the standards to the watersheds supporting those streams. The State also revised this provision to specifically identify the circumstances under which "existing interim discharges may be allowed until interceptors are available." Table F contains a listing of all Metropolitan No-Discharge Streams and was revised to include Pearson Creek in the Springfield area. These provisions are intended to be implemented in tandem with effluent regulations at 10 CSR 20-7.015(5).

B. Lake Taneycomo

State adoption of 10 CSR 20-7.031(9) is intended to codify the MCWC's "wishes to recognize the uniqueness of Lake Taneycomo...its importance as a trout fishery and as the central natural resource in the rapidly developing Branson area and threats to the lake's water quality imposed by development." This provision provides that more stringent approaches to the development of effluent rules, discharge permits and nonpoint source management plans and permits are to be employed regarding activities within the Lake Taneycomo watershed. The use of best treatment technology for point and nonpoint-source discharges in the Lake's watershed is also required. These provisions are intended to be implemented in tandem with effluent regulations at 10 CSR 20-7.015(3)(F).

C. Losing Streams

State adoption of 10 CSR 20-7.031(11) describes the timing of the process by which “losing streams” are identified, how permits addressing discharges to these or nearby streams are affected by such determinations and how existing facilities in proximity to these stream segments subsequently determined to be losing are to be regulated. Table J was also added to the standards and contains a listing of “losing streams” identified by MDNR. These provisions are intended to be implemented in tandem with effluent regulations at 10 CSR 20-7.015(4).

D. Effluent Regulations

In its 1993 action, MDNR proposed certain provisions pertaining to Effluent Regulations under 10 CSR 20-7.015. Provisions include: (1) the removal of the lagoon exemption from compliance with special bacteria discharge limitations; (2) the inclusion of phosphorous discharge limitations for Lake Taneycomo and tributaries; (3) the removal of small lagoon exemption for discharges to losing streams; (4) the incorporation by reference of Federal requirements for management of bio-solids; and, (4) the addition of Bypass prohibitions and requirements in anticipation of federal regulations (although not adopted in the MCWC’s final action). While these provisions are not subject to EPA review and approval under the water quality standards regulations, we nonetheless commend the MDNR’s actions in these areas.

E. Outstanding State Resource Waters

EPA acknowledges the addition of 24 new waters to Table E -Outstanding State Resource Waters (OSRWs) under 10 CSR 20-7.031 and the revision to one other previously listed water to extend the length of its designation. These OSRSs fall between Tier 2 and Tier 3. EPA accepts this additional tier because it is effectively a more stringent application of the Tier 2 provisions of the anti-degradation policy and, therefore, permissible under section 510 of the CWA, 33 U.S.C. 1251 et seq.

F. Specific Criteria

10 CSR 20-7.031 (4) Specific Criteria: (A) Application of Table A Values

The addition of the reference to Health Advisories (HA) levels listed in Table A of 10 CSR 20-7.031 under subsection (4)(A) states that the MDNR will use these values in “establishing discharge permit limits and management strategies until additional data becomes available to support alternative criteria, or other standards are established.” With the exception of bis-2-chloroisopropyl ether, which is an EPA listed priority pollutant, these health advisory levels address pollutants for which there are no water quality criteria for the protection of human health under section 304(a) of the CWA nor, for that matter, Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act (SDWA). Rather, these values are derived from Health Advisories published by EPA under the Safe Drinking Water Act. Despite the absence of

federally recommended water quality criteria under the CWA or MCLs under the SDWA, the state saw fit to regulate these pollutants in order to be more protective of the Drinking Water Supply use. While the addition of the reference to HA levels is commendable, EPA cannot take any formal action to approve this addition because of the absence of federally recommended water quality criteria.

G. Groundwater

10CSR 20-7.031 (5)(A) Application of Table A Values

The addition of the reference to Health Advisory levels listed in Table A of 10 CSR 20-7.031 under section (5)(A) states that the MDNR will use these values in “establishing management strategies and ground water cleanup criteria, until additional data becomes available to support alternative criteria, or until other standards are established.” This language is nearly identical to that adopted under subsection (4)(A) with regard to discharge permits and management strategies. Again, with the exception of bis-2-chloroisopropyl ether, which is an EPA listed priority pollutant, these health advisory levels address pollutants for which there are neither water quality criteria for the protection of human health under section 304(a) of the CWA nor Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act (SDWA). Rather, the values are derived from Health Advisories published by EPA under the SDWA. Because the CWA does not require state adoption of groundwater criteria, these pollutants would not otherwise be regulated under Missouri’s water quality standards. While the EPA commends the state for adopting these values for use in ground water management activities and as clean-up criteria, which both address potential exposure to surface waters under the influence of ground water, the EPA cannot take any formal action to approve this addition because of the absence of federally recommended water quality criteria and because the CWA does not require state adoption of groundwater criteria.. Again, EPA acknowledges the state’s effort to provide further protection to human health.

10 CSR 20-7031 (5)(C) Application of Table A Values to Aquifers

The State broadened the application of Table A values for the protection of ground water in aquifers under the State water quality standards by eliminating the reference to a vertical component under subsection (5)(C)1. and areal restrictions under subsection (5)(C)2. The effect of these revisions is to remove any limitation to the application of the water quality standards applicable to ground water to any part of an aquifer. Previous standards limited the application of criteria to a point at which ground water becomes waters of the State, which “will normally be at the next downgradient property boundary.” Because the CWA does not require state adoption of ground water criteria nor defines ground water as a Water of the United States, the EPA cannot take formal action to approve this addition. Nevertheless, the EPA commends the state’s effort to provide adequate protection of surface waters under the influence of ground water.

H. Drinking Water Supply

Missouri adopted a value of 90 ug/l for Bromochloromethane which the State relies upon to protect its Drinking Water Supply and Groundwater uses. EPA has not published section 304(a) water quality criteria nor promulgated MCLs for this pollutant. Once more, this value is less stringent than the current SDWA Health Advisory of 1.0 ug/l for this pollutant. Although we believe this value was adopted in error, EPA cannot take any formal action to disapprove this addition because of the absence of federally recommended water quality criteria.

I. 10 CSR 20-7.031(4)(P) WET Chronic Tests

This provision describes the manner in which whole effluent toxicity (WET) testing is to be conducted as part of the specific criteria applied to all classified waters. Subsection (1)(E), which defines chronic toxicity, relates that “chronic toxicity is also indicated by an overreach of WET test conditions of subsection (4)(P)”. Hence, these tests serve to implement the definition of chronic toxicity as applied to effluent discharges. According to this provision, WET tests are to be conducted using “at least two representative, diverse species and provides that the State may interpret the results of such tests considering the potential for pollutant volatilization and bio-degradation in the mixing zone. This provision is principally a NPDES permits concern and therefore is not subject to EPA review and approval under Section 303(c).

Although EPA cannot take formal action to disapprove this addition, EPA does have the following comments concerning the application of this provision: Due to the lack of detailed implementation procedures, the prevention of toxicity to receiving waters on a case-by-case basis is not ensured and an impairment of uses may result. Current federal regulations at 40 C.F.R. §136 contain the testing methodology acceptable for purposes of determining compliance with WET permit limitations under the National Pollutant Discharge Elimination System (NPDES). This methodology specifies acceptable test species and testing conditions upon which compliance with NPDES permits are to be measured. The State could address this issue during the next triennial review of State WQSs by replacing language specifying species selection and the interpretation of test results with language specifically referencing methods at 40 C.F.R. §136 for WET testing. Alternatively, the State could also develop it's own procedures detailing the implementation of this provision.

SECTION II: ITEMS EPA IS APPROVING

Under Section 303(c) of the CWA, the EPA administrator is charged with reviewing and approving or disapproving state-adopted water quality standards. In order to determine if new or revised state water quality standards are consistent with the federal regulations and the CWA, pursuant to EPA regulations at 40 C.F.R. § 131.5 and 131.6, EPA must review the water quality standards and determine: 1) whether the state has designated beneficial uses for water bodies that are consistent with the goals of CWA Section 101(a)(2), and if not, whether the state has conducted a use attainability analysis to justify its designation, see 40 C.F.R. § 131.10; 2)

whether water quality criteria were adopted to protect designated uses; 3) whether the state has adopted water quality standards according to its legal procedures; 4) whether state standards that do not include designated beneficial uses consistent with CWA Section 101(a)(2) were developed in a scientifically appropriate manner; and 5) whether the state submission includes minimum requirements for water quality standards submissions to EPA. The following items are new or revised provisions which EPA is approving:

A. Definitions

The following definitions were revised to clarify the meaning or added to update the reference to applicable guidance or regulations for particular terms within the State water quality standards. These new and/or revised definitions outlined below are consistent with the CWA, federal regulations implementing water quality standards, and EPA guidance or policy and are hereby approved:

10 CSR 20-7.031 Water Quality Standards

(1) Definitions

- (A) Acute toxicity;
- (B) Aquifer;
- (C) Beneficial water uses;
 - 7. Human health protection (Fish consumption and secondary contact recreation);
 - 12. Wetlands (deleted from 1991 standards)
 - 12. Storm- and flood-water storage and attenuation
(assumes the position formerly occupied by Wetlands in the 1991 standards);
 - 13. Habitat for resident and migratory wildlife species, including rare and endangered species;
 - 14. Recreational, cultural, educational, scientific and natural aesthetic values and uses;
 - 15. Hydrologic cycle maintenance;
- (D) Biocriteria;
- (E) Chronic toxicity;
- (F) Classified waters,
 - 3. Class L3 - Other lakes;
 - 7. Class W;
- (G) Ecoregion;
- (H) Geometric mean;
- (L) Losing stream;
- (M) Low-flow conditions;
- (P) Outstanding state resource waters;
- (R) Reference stream reaches;
- (S) Waters of the State (deleted from 1991 standards);

- (T) Water hardness (assumed the position formerly occupied by “Waters of the State” in the 1991 standards);
- (X) Wetlands (moved from (W) to (X); current definition was refined or expanded.

B. Antidegradation

10 CSR 20-7.031 (2) Antidegradation, (A) and (B)

The State revised its antidegradation policy to provide more specificity regarding the three levels of protection required under federal regulation at 40 C.F.R. §131.12. Subsection (2)(A) of the State’s antidegradation policy which describes the protection of high quality waters (i.e., Tier 2) was revised and moved to an added subsection (2)(B). Subsection (2)(A) under the effective water quality standards now describes the protection of existing uses under Missouri’s antidegradation policy (i.e., Tier 1). Subsection (2)(C) was added to contain the existing language describing the protection of existing water quality in outstanding state resource waters and outstanding national resource waters (i.e., Tier 3). The adopted revisions are consistent with federal regulations at 40 C.F.R. §131.12 and constitute an improvement in the State’s policy by clarifying the application of the three tiered levels of protection to waters of the United States within Missouri. These provisions are approved as this approach is consistent with EPA regulation and guidance with respect to antidegradation policy and represents an improvement over past antidegradation policies.

C. General Criteria

10 CSR 20-7.031 (3) General Criteria, (D)

The State revised its General Criteria, which serve as the narrative water quality criteria or “free froms” within Missouri’s water quality standards, by modifying the provision under subsection (D) which prohibits substances or conditions in sufficient amounts to “have a harmful effect on human, animal or aquatic life” to instead prohibit substances or conditions in sufficient amounts to “result in toxicity to human, animal or aquatic life.” This revision clarifies and allows for a more precise interpretation of this provision and is consistent with the CWA and 40 C.F.R. §131.11(b)(2) and is hereby approved. Other harmful effects, beyond toxicity, are covered elsewhere under Missouri’s General Criteria.

10 CSR 20-7.031 (3) General Criteria, (G) and (H)

The State revised its General Criteria to add a provision under subsection (G) which prohibits “physical, chemical or hydrologic changes that would impair the natural biological community.” The State also added a provision under subsection (H) which prohibits placing miscellaneous debris and solid waste into the waters of the State. These provisions are consistent with the CWA, federal regulations at 40 C.F.R. §131.11(b)(2) and clarify the level of protection provided all waters of the state under its General Criteria and are hereby approved.

D. Specific Criteria

10 CSR 20-7.031 (4) Specific Criteria

The introductory narratives under section (4), Specific Criteria, were revised to add provisions qualifying the protection of the drinking water supply, the whole-body contact recreation and the livestock and wildlife watering uses previously included under the General Criteria at subsection (3)(D) 1 and 2. The movement of these provisions from section (3) to section (4) did not involve any change to the original language and is hereby approved.

10 CSR 20-7.031 (4)(A)(3) Exceptions to the Application of Specific Criteria to Non-Point Sources of Pollution

In its revisions to its water quality standards, the State removed a provision under subsection (4)(A)(3) which provided an exception to the application of the Specific Criteria in Tables A and B where a “stream or lake is subjected to degradation due to nonpoint sources of pollution above the level of control which can be achieved through the use of feasible and cost-effective best management practices...”. This exception to the application of the State’s numeric water quality criteria was not based on any scientific justification, would not protect designated uses and was not consistent with the CWA. Although certain activities might not be subject to the application of certain controls under state or federal law, all “waters of the U.S.” must be protected under the State’s water quality standards such that their designated uses are protected. The removal of this exception by the State eliminates this inconsistency with the CWA and is hereby approved.

10 CSR 20-7.031 (4)(A)5.A Mixing Zones

Revisions to the State’s mixing zone provisions in subsection (4)(A)6.A of the 1991 standards included modifying the exemption from the chronic toxicity requirements for surface waters within mixing zones to provide an exemption for these waters from the chronic criteria requirements instead. This revision to the State’s mixing zone provisions is consistent with section 101(a)(3) of the CWA which prohibits toxicity in the “waters of the U.S.”. As mixing zones are limited areas within surface water segments in which numeric water quality criteria may be exceeded as long as the designated uses of the segment are protected, the exemption should apply to the application of the appropriate criteria rather than to toxicity. The CWA is clear that there is to be no toxicity in surface waters. Given the proper placement and sizing of mixing zones and recognizing all three components of water quality criteria design (i.e., magnitude of exposure, averaging period of exposure, frequency of exceedence), pollutant concentrations can exceed applicable criteria without causing toxicity (TSD, 1991). For mixing zones and zones of initial dilution, the chronic and acute criteria, respectively, can be exceeded without causing chronic or acute toxicity if these areas are properly placed and limited in size. This subsection was renumbered to (4)(A)5.A and is approved.

Also within this subsection, the State modified its mixing zone provisions to add language exempting thermal mixing zones from the application of the mixing zone size criteria described under subsection (4)(A)5. Criteria for determining thermal mixing zone size were moved to a new subsection (4)(D)6. This revision is approved.

10 CSR 20-7.031(4)(A)5.B.(I)(a) Mixing Zones for Class C Streams and Streams with 7Q10 Low Flows of 0.1 cfs or Less

Revisions to the State's mixing zone provisions in subsection (4)(A)6.B.(I)(a). of the 1991 standards included reducing the mixing zone length for discharges to these streams from one-half mile to one-quarter mile. This revision to the State's mixing zone regulations is an improvement in the level of protection afforded these streams; however, there is a caveat regarding this provision which should be addressed during the next triennial review of the State's WQS. EPA's concern is discussed further in Section IV of this letter under the heading of "Mixing Zones for Class C Streams and Streams with 7Q10 Low Flows of 0.1 cfs or Less". Notwithstanding EPA's overall concern with this provision, the reduction of the mixing zone length specified in this subsection, which was also renumbered to (4)(A)5.B.(I)(a), is approved.

10 CSR 20-7.031(4)(A) 5. B.(III)(a) Mixing Zones for Streams with 7Q10 Low Flows of Greater Than 20 cfs

The State modified its mixing zone provisions, contained in the 1991 standards at 10 CSR 20-7.031(4)(A) 6.B. (III), to remove reference to thermal mixing zones and, specifically, restrictions on their length. Criteria for determining thermal mixing zone size were moved to a new subsection of the 1996 standards at 10 CSR 20-7.31(4)(D)6. This revision is approved.

10 CSR 20-7.031(4)(A)5.B.(III)(b) Zones of Initial Dilution for Streams with 7Q10 Low Flows of Greater Than 20 cfs

The provision at subsection (4)(A)6.B.(III)b. addressing restrictions to the size of zones of initial dilution (ZIDs) for discharges to these streams was modified to further restrict the volume of dilution available within the ZID. Previous regulatory language restricts dilution within ZIDs to one-tenth of the mixing zone width, cross-section or volume. The added language further restricts the volume available for dilution within the ZID to "no more than ten times the effluent design flow volume unless the use of diffusers or specific mixing zone studies can justify more dilution." This subsection was also renumbered to (4)(A)5.B.(III)(b) and is approved.

10 CSR 20-7.031(4)(A)5.B.(IV)(b) Zones of Initial Dilution for Lakes

The provision at subsection (4)(A)6.B.(IV)b. addressing restrictions to the size of zones of initial dilution (ZIDs) for discharges to lakes was modified to eliminate the use of ZIDs in these waters. This subsection was also renumbered to (4)(A)5.B.(IV)(b) and is approved.

10 CSR 20-7.031(4)(A)5.D. Further Restrictions to the Application of Mixing Zones

The MDNR has revised its mixing zone regulations under the subsections identified below to provide more clarification and appropriate protectiveness to aquatic resources of the State. These provisions are approved as they are consistent with federal regulations at 40 C.F.R. § 131.13 and current EPA guidance regarding mixing zones.

Provisions at (4)(A)6.D. described receiving water characteristics and conditions which would justify further restricting the “size and location of mixing zones” beyond what was described at (4)(A)6.B. The State modified these provisions to allow the prohibition of mixing zones under the specified characteristics or conditions. The State also expanded the characteristics and conditions justifying the further restrictions to include “potential effects on mouths of tributary streams” and “proximity to water supply intakes.” This subsection was also renumbered to (4)(A)5.D and is approved.

10 CSR 20-7.031(4)(B)1. Toxic Substances

Provisions at (4)(B)1. described the use of effluent toxicity studies or site-specific instream biological studies to develop alternate effluent limits not based on State-adopted pollutant-specific water quality criteria. The State removed this language and adopted alternative language which exclusively reflects EPA guidance on site-specific criteria development, including approaches such as the Water Effects Ratio approach supported by EPA. This revision also includes specific language which provides for State consideration of EPA guidance. This revision removed a provision which could be used to develop effluent limitations inconsistent with federal regulation and effective State standards, clarifies the State’s use of site-specific criteria and is consistent with EPA guidance and regulation. This revision is approved.

10 CSR 20-7.031(4)(C) Fecal Coliform Bacteria

As discussed earlier, the introductory narratives under subsection (4), Specific Criteria, were revised to add provisions addressing the protection of the drinking water supply, the whole-body contact recreation and the livestock and wildlife watering uses previously included under the General Criteria at subsection (3)(D) 1 and 2. Subsection (4)(C) was revised to duplicate the portion of this introductory narrative addressing whole body contact. The duplication of this provision addressing the protection of the whole body contact use in subsection (4)(C) did not involve any change to the original language earlier in this subsection and is hereby approved.

10 CSR 20-7.031(4)(C) Fecal Coliform Bacteria

The State removed provisions at (4)(C)1. and 2. describing the data requirements supporting determinations of potential and verified noncompliance with the State criteria for fecal coliform bacteria. This language specified that a geometric mean of a minimum number of ambient samples was to serve as the basis for determinations of noncompliance. The removal of

this language, in combination with the existing provision at (4)(C), would indicate that the State's fecal coliform criterion are to be applied as maximum or "not to be exceeded" values. EPA believes this approach will protect the whole body contact use. This revision is approved.

10 CSR 20-7.031(4)(D) Temperature

The State revised its water quality criteria for temperature for general and limited warm-water fisheries, cool-water fisheries and cold-water fisheries at subsections (4)(D)1, 2 and 3. These revisions added language expanding the application of these criteria to "physical alteration of the water course" in addition to the previously listed "water contaminant sources." These revisions result in an expanded level of protection afforded surface waters from activities which might raise ambient water temperatures above levels which support aquatic life. These revisions are approved.

The State also revised provisions at (4)(D)5. by removing language specifying the allowed size of the thermal mixing zone. Thermal mixing zone specifications were also moved from subsection (4)(A)6.B.(III)a. and, together with the language removed from subsection (4)(D)5., placed in a newly created subsection (4)(D)6 with no substantive change to the language itself. These revisions to the thermal mixing specifications did, however, include a change in the provisions governing thermal mixing zone length. Previously, thermal mixing zone length was restricted to one-quarter mile and mixing zone width to one-quarter of the stream width or cross-sectional area under provisions at subsection (4)(A)6.B.(III)a. The added language specifies that "lengths and widths within rivers, and all plume dimensions within lakes, shall be determined on a case-by-case basis and shall be based on physical and biological surveys when appropriate." This provision provides for site-specific determinations of thermal mixing dimensions, is more scientifically defensible, is more likely to provide protection for aquatic life at specific sites and is consistent with the CWA. This revision is approved.

10 CSR 20-7.031(4)(L) Sulfate and Chloride Limit for Protection of Aquatic Life

The State revised portions of its Specific Criteria addressing sulfate and chloride under subsection (4)(L). Specific reference to the presence of chloride criteria within 10 CSR 20-7.031 at Table A was added to this subsection at (4)(L)1. This reference to the chloride criteria in Table A recognizes a "layer" of protection for aquatic life and human health additional to that provided by the combined sulfate and chloride criteria included at subsection (4)(L). This revision is approved.

Subsection (4)(L) was further revised at (4)(L)2. to provide that determinations of natural background concentrations of total sulfate plus chloride, which serves as the basis for aquatic life criteria for streams with a 7Q10 flow greater than 1 cfs, are to be determined at the 60Q10 stream design flow. The previous standards specified the use of the 60Q2 stream design flow in the determination of natural background concentrations of total sulfate and chloride. This revision will provide improved protection of aquatic life through the application of a more conservative stream design flow in the determination of criteria based on natural concentrations of sulfate and chloride. EPA believes this provision adequately protects aquatic life uses because: (1) it will

provide improved protection of aquatic life through the application of a more conservative stream design flow in the determination of criteria based on natural concentrations of sulfate and chloride; (2) this revision constitutes an improvement in the level of protection afforded aquatic life; (3) the criteria specific to chloride are based on EPA guidance; and, (3) EPA has no criteria for total sulfate and chloride. This revision is approved.

10 CSR 20-7.031(4)(M) Carcinogenic Substances

This subsection was revised to include a reference to the risk assumptions upon which the State's water quality criteria for carcinogenic substances are based. For carcinogenic pollutants, the water quality criteria which are designed to protect human health based on fish consumption are risk-based and are derived using specific assumptions of exposure (i.e., amounts of water and fish consumed). Water quality criteria for carcinogenic pollutants designed to protect surface waters designated for use as a drinking water supply may be based solely on a similar risk assessment or may be based on MCLs promulgated by EPA under the authority of the Safe Drinking Water Act (SDWA). The SDWA considers risk to human health, but also integrates the capabilities of pollutant removal technologies and pollutant removal costs into the identification of MCLs. This revision identifies applicable risk assumptions integral to the calculation of certain criteria for the protection of human health and assists the public in its understanding and review of the State's water quality standards. This revision is approved. EPA encourages the State to adopt water quality criteria for the protection of the drinking water supply use which are solely risk-based. Risk-based criteria for human health for carcinogens are published by EPA under section 304(a) of the CWA.

10 CSR 20-7.031(4)(Q) Biocriteria

The CWA has as its objective "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The State of Missouri revised its water quality standards to explicitly recognize the need to protect the biological integrity of the waters of the U.S. In the late 1980s, EPA identified state adoption of narrative biological criteria as a water quality standards program priority, consistent with the objective of the CWA. EPA believes that the adoption of narrative biological criteria, in association with the adoption of more biologically-based aquatic life use descriptions, by states and authorized tribes, are necessary steps to the development and adoption of numeric biological criteria. The narrative biocriteria adopted by the State at subsection (4)(Q) state that "The biological integrity of waters ...shall not be significantly different from reference waters." Determinations of "biological status" based on biological indices and ecoregionally-based reference conditions are consistent with current science and EPA guidance and will provide more complete protection of the State's aquatic life uses. This provision is approved.

10 CSR 20-7.031 Table B

The addition of the footnote to Table B clarifying that the ammonia criteria are expressed as total ammonia is approved.

E. Outstanding State Resource Waters

Revisions to 10 CSR 20-7.031(8) broadened the criteria by which waters are determined to qualify as Outstanding State Resource Waters (OSRW). The criteria were expanded to include waters "which are leased or held in perpetual easement for conservation purposes by a state, federal or private conservation agency or organization." Previously, OSRWs were limited to waters which were located on or passed through state- or federally-owned lands. The expansion of the application of this higher level of protection afforded these important waters is consistent with the CWA and is approved.

F. Water Quality Criteria

Adoption of 103 Criteria for 80 Pollutants to Protect Aquatic Life and Public Health

MDNR's revisions to 10 CSR 20-7.031 Table A added new numerical water quality criteria and made modifications to existing numerical criteria for the protection of aquatic life uses and human health protection. These numeric water quality criteria revisions (see enclosure, Table 1) result in criteria that are as stringent as EPA guidance criteria under Section 304(a) of the CWA or standards promulgated under the SDWA and are hereby approved. New or revised criteria that are disapproved by EPA are discussed in Section III (a) of this letter and listed in Table 3 of the enclosure.

EPA is approving ten water quality criteria for the protection of aquatic life for selenium, aluminum, chloride, chlorine, oil and grease, sulfate plus chloride and sulfide-hydrogen sulfide. With the exception of the State-adopted criteria for oil and grease and sulfate plus chloride, all the State-adopted criteria are as stringent or more stringent than those criteria for the protection of aquatic life published by EPA under section 304(a) of the CWA. EPA has not published guidance water quality criteria for oil and grease or for sulfate plus chloride, but believes that the State-adopted criteria are protective of aquatic life and are approved. EPA is also approving the State's removal of its criterion for the protection of aquatic life against chronic exposures to silver. Since EPA's removal of its own guidance chronic criterion for silver in 1992, EPA has had no chronic criterion for silver. EPA continues to evaluate the data currently available regarding the chronic toxicity of silver to aquatic life. Until EPA publishes a guidance chronic criterion for silver, the State should rely on its general water quality criteria to protect against chronic toxicity to aquatic life from exposures to silver in surface waters.

The State has added new water quality criteria or revised existing criteria for the protection of human health through the consumption of fish for 25 pollutants. These State-adopted criteria are equal to or more stringent than the guidance criteria published by EPA under authority at section 304(a) of the CWA, are protective of human health and are approved.

EPA is also approving 70 State water quality criteria for the protection of the State's Drinking Water Supply use which are based on either the maximum contaminant level (MCL) promulgated by EPA under authority of the Safe Drinking Water Act or CWA section 304(a) guidance water quality criteria for the protection of human health through exposures to

contaminants in water and fish. Where the State has adopted the MCL and EPA has published a more stringent water quality criterion for the protection of human health through the consumption of drinking water under section 304(a) of the CWA, EPA will approve the MCL-based criterion if the State has also adopted a water quality criterion for the protection of human health through the consumption of fish which is equivalent to or more stringent than the comparable criterion published under section 304(a) of the CWA. The MCL-based criterion does not provide protection to human health comparable to the section 304(a) criterion because it accounts for exposures to contaminants only through the consumption of water. The section 304(a) criterion accounts for contaminant exposures through both water and fish consumption. As the State applies its fish consumption criteria to all classified waters, the combination of the fish consumption criterion with the MCL-based criterion provides protection for Missouri's Drinking Water Supply use equivalent to that provided by criteria published for this use under section 304(a) of the CWA. EPA is also approving Missouri's adoption of 52 Health Advisories which the State relies upon to protect its Drinking Water Supply and Groundwater uses until MCLs are promulgated or section 304(a) criteria are published by EPA for those pollutants. EPA has not promulgated MCLs nor published guidance water quality criteria for these pollutants, but we believe that the State's application of Health Advisories developed by EPA under the SDWA to its surface waters provides an improved level of protection for human health and is approved.

G. Designated Cold-Water Sport Fisheries, Table C

In revising its water quality standards, the State added 22 streams and modified its classification of 4 streams as Cold-Water Sport Fisheries (CWF) as listed in Table C to 10 CSR 20-7.031. Bender Creek (Texas County), Bryant Creek (Douglas County), Cedar Creek (Newton County), Dogwood Creek (Stone County), Hickory Creek (Newton County), Hobbs Hollow (Stone County), Horse Creek (Dent County), Hunter Creek (Douglas County), Hurricane Creek (Oregon County), Indian Creek (Stone County), Joyce Creek (Barry County), Little Sinking Creek (Dent County), Maramec Spring Branch (Phelps County), Mill Creek (Maries County), Shoal Creek (Newton County), Spring Creek (Douglas County), Spring Creek (Oregon County), Stone Mill Spring Branch (Pulaski County), Turkey Creek (Ozark County), Turnback Creek (Dade and Lawrence Counties), Warm Fork Spring River (Oregon County) and Woods Fork Bull Creek (Christian County) were added to Table C. The State also expanded the coverage of the CWF designation for Crane Creek (Stone and Lawrence Counties), Eleven Point River (Oregon County), Little Piney Creek (Phelps County) and Spring River (Lawrence County) within Table C. These actions constitute an improvement in the water quality protection afforded these waters consistent with 40 C.F.R. §131.10(h)(1) and is approved.

H. Designated Beneficial Uses, Tables G and H

The use designations adopted by the State for the lakes and streams listed respectively in Tables 2.1 and 2.2 of the enclosures to this letter are consistent with the CWA and federal regulations and are approved. The addition of new stream segments and lakes, splitting of existing segments that result in either a gain or no net loss of coverage, added use designations, increases in a stream segment length or lake acreage, corrections to coordinates, and name